

3 2002

02-DOE-00416

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Mr Steven Gunderson
Rocky Flats Cleanup Agreement Project Coordinator
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4300 Cherry Creek Drive South
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Dear Gentlemen

Enclosed for your review and approval is a copy of the "Final Work Plan for the Development of the Remedial Investigation and Feasibility Study Report". This Work Plan summarizes all activities currently foreseen during the planning and implementation of the Remedial Investigation/Feasibility Study to support the final action at the Rocky Flats Environmental Technology Site. We appreciate the assistance provided by yourselves and your agencies during our recent reviews of the draft Work Plan. We have revised the previous draft to incorporate your advice and comments into this final document. Please contact me at (303) 966-5918 or Scott R. Surovchak, of my staff, at (303) 966-3551 if you should have any questions or comments.

Sincerely,

Original signed by
Joseph A. Legare
Assistant Manager
for Environment and Stewardship

Enclosure

cc w/Enc
S Surovchak ER, RFFO
C Spreng, CDPHE
S Tarlton, CDPHE
G Kleeman, EPA
Administrative Record

cc w/o Enc
L Butler, K-H
M Anderson, K-H
D Shelton, K-H

bcc
Deputy Manager's Reading File, RFFO

Copy to Reading Room Yes No (please initial)

Orig 03/04/02

ER	ER	CR	AMES
Surovchak lm	Tyler	DiSalvo	Legare
03/ 4 /02	03/ 1 /02	03/ 5 /02	03/ /02

2

**ROCKY FLATS ENVIRONMENTAL
TECHNOLOGY SITE**

**FINAL WORK PLAN
for the
Development of the
Remedial Investigation
and
Feasibility Study
Report**

**Rocky Flats Environmental Technology Site
10808 Highway 93
Golden, CO 80403-8200**

March 11, 2002

**Reviewed for Classification/UCNI
DOCUMENT CLASSIFICATION REVIEW
WAIVER PER CLASSIFICATION OFFICE**

WAIVER NO CEX-105-01

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Attachment 1 - Streamlined Remedial Investigation/Feasibility Study Report Outline

Attachment 2 – Draft RI/FS Report Schedule

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ACRONYMS AND ABBREVIATIONS

AL	Action Level
ALARA	As low as reasonably achievable
ALF	Action Levels Framework
AME	Actinide Migration Evaluation
ARAR	Applicable or Relevant and Appropriate Requirements
CAD	Corrective Action Decision
CDPHE	Colorado Department of Public Health and Environment
CEDE	Committed Effective Dose Equivalent
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Contaminant of Concern
CMS	Corrective Measures Study
CFR	Code of Federal Regulations
CHWA	Colorado Hazardous Waste Act
CRA	Comprehensive Risk Assessment
DOE	U S Department of Energy
DQO	Data Quality Objective
EPA	Environmental Protection Agency
ER	Environmental Restoration
FS	Feasibility Study
IHSS	Individual Hazardous Substance Site
NFA	No Further Action
IGD	Implementation Guidance Document
K-H	Kaiser-Hill Company, L L C
LRA	Lead Regulatory Agency
PAC	Potential Area of Concern
PRG	Preliminary Remediation Goal
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFI	RCRA Facility Investigation
ROD	Record of Decision
RSAL	Radionuclide Soil Action Level
RSOP	RFCA Standard Operating Protocol
SR	Summary Report
SWWB	Site Wide Water Balance
TM	Technical Memorandum

1 0 INTRODUCTION

This Work Plan describes the activities that will be conducted in the preparation of a draft Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation/Feasibility Study (RI/FS) report for the Rocky Flats Environmental Technology Site (RFETS or the Site). Because remedial activities at the Site are also being conducted under the Resource Conservation and Recovery Act (RCRA) and the Colorado Hazardous Waste Act (CHWA), the report will satisfy the RCRA/CHWA requirements for a RCRA Facility Investigation/Corrective Measures Study (RFI/CMS) report. For simplicity, the report is hereinafter referred to as the RI/FS report. The draft RI/FS report will be prepared concurrently with the conduct of accelerated actions that will be performed to achieve Site cleanup. When approved by the regulators, the RI/FS report will be the basis for development of a Proposed Plan that describes the preferred proposed final remedy for the Site. The Proposed Plan is the basis for the final Corrective Action Decision/Record of Decision (CAD/ROD).

2 0 BACKGROUND

In 1996, the Department of Energy (DOE), the Environmental Protection Agency (EPA), and the Colorado Department of Public Health and Environment (CDPHE) executed the Rocky Flats Cleanup Agreement (RFCA).¹ RFCA is the Federal Facility Compliance Agreement and Consent Order negotiated pursuant to CERCLA², RCRA³, and the CHWA.⁴ RFCA provides the regulatory framework for attaining the near and intermediate term objectives to cleanup the Site expressed in the Rocky Flats Vision and the RFCA Preamble.⁵ DOE intends to achieve accelerated cleanup in a manner that is safe to workers and the public, and is protective of the environment. As provided in RFCA, DOE intends to disposition all special nuclear material (SNM) and regulated wastes, remove, size reduce, and decontaminate facility components ("deactivation"), demolish facilities ("decommissioning"), and cleanup contaminated areas ("environmental restoration [ER]") so that future land and water uses are adequately protected. Cleanup is currently scheduled for completion in December of 2006.

In order to streamline cleanup of the Site, RFCA adopted an accelerated action cleanup approach, as described in RFCA paragraph 79.

To expedite remedial work and maximize early risk reduction at the Site, the Parties intend to make extensive use of accelerated actions to remove, stabilize, and/or contain Individual Hazardous Substance Sites (IHSSs).

DOE intends that completion of accelerated actions will achieve the RFCA Intermediate Site Condition with little or no further actions required to satisfy RCRA/CHWA and CERCLA requirements pursuant to any final CAD/ROD. Thus, it is important to formally document the expected final remedial action objectives, i.e., cleanup goals, and the key factors that influence how completion of accelerated actions will be highly

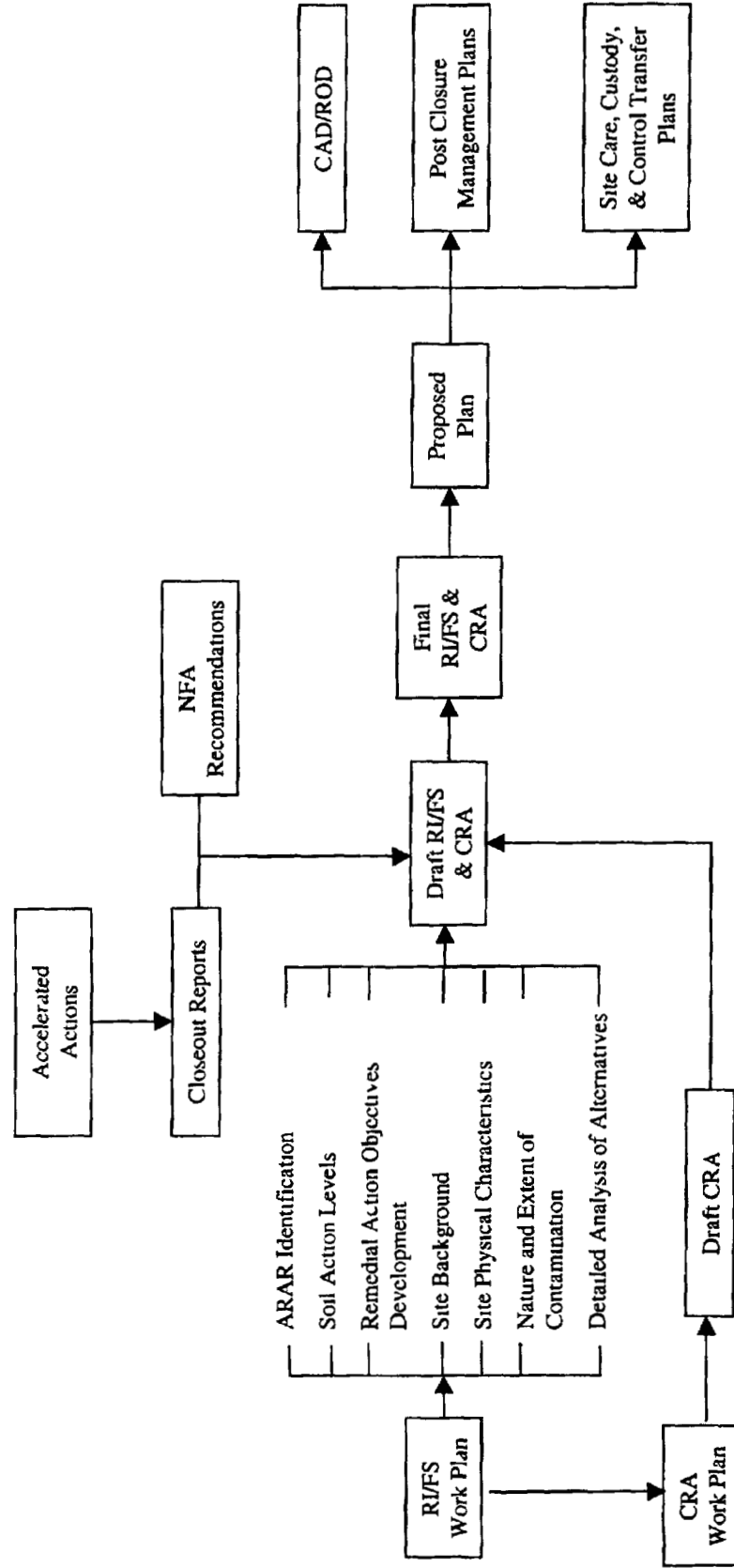
-
- 1 Final Rocky Flats Cleanup Agreement (RFCA), Federal Facility Agreement and Consent Order (CERCLA VIII-96-21, RCRA 3008[h] VIII-96-01, State of Colorado Docket 96-07-19-01), July 19, 1996
 - 2 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9620 *et seq*
 - 3 Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments Act (HSWA) and the Federal Facility Compliance Act (FFCA), 42 USC 6901 *et seq*
 - 4 Colorado Hazardous Waste Act (CHWA), CRS 25-15-101 *et seq*
 - 5 The Rocky Flats Vision is contained in Appendix 9 of RFCA

consistent with these expected objectives or goals. The expected final cleanup goals will be described in Technical Memoranda (TMs). The TMs will provide the basis to modify, as appropriate, RFCA Attachments. Preparation of the TMs and modification of the RFCA Attachments are the first tasks to be performed pursuant to this Work Plan. Subsequent tasks include preparation of a Comprehensive Risk Assessment (CRA) Work Plan, a draft CRA, a Detailed Analysis of Alternatives TM, and Summary Reports (SRs) that constitute the remaining sections of the draft RI/FS report.

3.0 SCOPE OF WORK

TMs, SRs, and a draft CRA will be prepared over the course of Site cleanup. These documents, in aggregate, will constitute the draft RI/FS report. Initially, several TMs will be prepared to provide final cleanup goals for the Site. For the purposes of implementing this RI/FS work plan, TMs identified herein will be released for informal public comment, and submitted for regulator review and approval. Disapproval of a TM shall be subject to Dispute Resolution pursuant to RFCA Part 15, Subpart B. Subsequent modifications to RFCA Attachments based upon regulator-approved TMs shall be subject to review, including formal public review and comment, and approval pursuant to RFCA requirements. The SRs will be prepared to fulfill other CERCLA requirements for a RI/FS report, including a presentation of the Site background, the physical characteristics of the Site, and the nature and extent of contamination. The SRs will incorporate the results of completed characterizations, remedial action close out reports, and NFA documentation. A draft CRA will also be prepared that will provide an estimate of human health and ecological risk posed by the Site after completion of all accelerated actions. Lastly, a TM that provides a detailed evaluation of remedial alternatives for final action will be prepared. The TMs, SRs, and draft CRA will be assembled into the draft RI/FS report. The draft RI/FS report will be used to support DOE's preparation of a final RI/FS report, Proposed Plan and Record of Decision (Figure 1). The outline of the draft RI/FS report is presented in Attachment 1.

Figure 1. RI/FS Report's Relationship to Other Final Closure Documents



4.0 TECHNICAL REQUIREMENTS/TASKS

Preparation of the draft RI/FS report will require execution of 15 tasks that involve identifying Site cleanup goals, describing the Site condition after all accelerated actions are completed, conducting a risk assessment, preparing an analysis of remedial alternatives for final action, and assembling/editing the draft RI/FS report

4.1 Task 1 – Prepare ARARs TM

A TM will be prepared that identifies the Applicable or Relevant and Appropriate Requirements (ARARs) for Site closure. While ARARs are not final until a final remedy has been selected in the CAD/ROD, it is anticipated that this TM will identify the ARARs that will inform the regulatory agencies' ultimate ARARs decision. Approval of the TM will allow accelerated actions and the detailed analysis of alternatives (Task 14) to be completed in accordance with the identified ARARs, to the extent practicable. Because the ARARs are not final until the CAD/ROD is approved, the ARARs could be modified during the CAD/ROD process.

This task will include a review of the latest Master List of Potential ARARs in the RFCA Implementation Guidance Document (IGD) and in recently prepared RFCA Standard Operating Protocols (RSOPs). The ARARs will be presented in a tabular format. The task includes incorporation of DOE and regulatory agency comments on the draft TM. The TM will be incorporated into the draft RI/FS report as Appendix F (See Attachment 1).

4.2 Task 2 – Prepare Soil Action Levels TM

To assess the need for, or extent of, remedial actions at potential contamination release sites, Action Levels (ALs) for environmental media were established and documented in RFCA Attachment 5, "Action Levels and Standards Framework for Surface Water, Ground Water, and Soils (ALF)" (March 21, 2000). Soil action levels are reviewed annually as part of the RFCA Annual Review process (RFCA paragraph 5).

A TM will be prepared that includes the rationale for new soil action levels, including the exposure model utilized as a basis, and the targeted risks to be attained. The TM will also identify the Contaminants of Concern (COCs) for the Site based on the screening activities conducted under Task 8, Prepare the CRA Work Plan. The task includes incorporation of DOE and regulatory agency comments on the draft TM. The TM will be incorporated into the draft RI/FS report as part of Section 3.2 (see Attachment 1).

4.3 Task 3 – Prepare Soils and Groundwater RAO TM

Remedial action objectives (RAOs) are the contaminants and medium specific goals designed to protect human health and the environment. These RAOs are used to develop Preliminary Remediation Goals (PRGs) that provide an acceptable contaminant level for each environmental medium. During the detailed analysis of alternatives (Task 14), remedial alternatives for final action will be evaluated, in part, based on their ability to achieve the PRGs. When the preferred final action is selected in the CAD/ROD, the PRGs will become remediation goals, and will be modified if necessary based on additional information gathered in the RI/FS.

A TM will be prepared that presents the RAOs for soils and groundwater. The RAOs will define human and ecological exposure scenarios consistent with the reasonably foreseeable anticipated future land use, the target risk levels, and the resulting PRGs for surface soil, subsurface soil, and groundwater (PRGs will be calculated under Task 8). Risk levels for unrestricted release will also be addressed. The RAOs will examine both CERCLA and RCRA requirements and will provide a unified approach to meeting these regulatory requirements. The task includes incorporation of DOE and regulatory agency comments on the draft TM. The TM will be incorporated into the draft RI/FS report as Sections 6.2 through 6.5 (see Attachment 1).

4.4 Task 4 – Prepare Surface Water RAO TM

The surface water RAO TM will define the cleanup goals for this environmental medium, and will define water quality parameters and standards to be met, points of compliance, and how compliance is to be demonstrated. The task includes incorporation of DOE and regulatory agency comments on the draft TM. The TM will be incorporated into the draft RI/FS report as Section 6.6 (see Attachment 1).

In the detailed analysis of alternatives (Task 14), final actions will be evaluated using the appropriate studies and models, to determine if the surface water RAOs can be met.

4.5 Task 5 – Modify RFCA Attachments

Attachment 5 to RFCA presents the action levels for soil, groundwater, and surface water, and accordingly, will require modification based on the soil action levels defined in the TM prepared under Task 2, as well as on the RAOs defined in the TMs prepared under Tasks 3 and 4. The ARARs presented in the Task 1 TM will be formatted as a new Attachment to RFCA. ARARs currently in Appendix J to the IGD may be deleted to avoid confusion. The RFCA attachment modifications will be subject to regulatory agency review and public comment. The task includes incorporation of regulatory agency and public comments on the RFCA Attachment modifications. Once approved, the RFCA Attachments will provide the guidelines for cleanup of the Site through accelerated actions.

4.6 Task 6 – Prepare Site Background SR

A SR will be prepared that summarizes background information for RFETS. The SR will include a site description, a discussion of the site history, operable units, previous investigations, and accelerated actions, and the results of previous CERCLA 5-year reviews. The information for this SR will be gathered from existing reports, and will be compiled and edited to satisfy the CERCLA RI report requirement. The SR will be incorporated into the draft RI/FS report as Section 1 (see Attachment 1).

4.7 Task 7 – Prepare Physical Characteristics of the Study Area SR

A SR will be prepared to summarize the physical characteristics of the Site, including surface features, meteorology, surface water hydrology, geology, soils, hydrogeology, demography and land use, and ecology. The information for this SR will be gathered from existing reports, and will be compiled and edited to satisfy the CERCLA RI report requirement. As appropriate, results from the Site Wide Water Balance (SWWB) will be included. The SR will include figures that adequately portray the physical characteristics of the Site. The SR will be incorporated into the draft RI/FS report as Section 2 (see Attachment 1).

4.8 Task 8 – Prepare the CRA Work Plan

A Comprehensive Risk Assessment (CRA) Work Plan will be prepared that details the activities that will be necessary to perform the CRA. The Work Plan will include the following:

- 1 Data Quality Objectives
- 2 Site Conceptual Model including exposure scenarios, exposure pathways, and receptors
- 3 Final list of COCs following statistical evaluation and preliminary screening
- 4 Reasonably foreseeable anticipated land use and use restrictions for the Site
- 5 Background concentrations for COCs
- 6 Established detection limits for COCs
- 7 COC physical and chemical characteristics
- 8 Methods for conducting the exposure assessment, toxicity assessment, and the risk characterization
- 9 Fate and transport models used to predict exposure point concentrations
- 10 Calculated PRGs for surface soils, sediments, and groundwater from a human health and ecological perspective

The Work Plan will be subject to DOE and regulatory agency review and approval. The task includes incorporation of DOE and regulatory agency comments on the draft Work Plan. The Work Plan will be incorporated into the draft RI/FS report as Sections 3.1 and 4, and Appendix E (see Attachment 1).

4.9 Task 9 – Prepare the Nature and Extent of Air Contamination SR

This SR will summarize the types of contaminants present in air at the Site, as well as their concentrations, on- and off-site. Both radionuclides and non-radionuclides will be addressed, although the focus will be on radionuclides. Sources and migration patterns for the contamination will be discussed. The SR will include figures that adequately portray the distribution and migration of contaminants in air at the Site, including depiction of any radiological contamination that exceeds applicable standards based on ARARs for the Site. The SR will serve to satisfy the CERCLA RI report requirements for a presentation of the nature and extent of air contamination. The SR will be incorporated into the draft RI/FS report as Section 3.6 (see Attachment 1).

4.10 Task 10 - Prepare the Nature and Extent of Groundwater Contamination SR

This SR will summarize the types of contaminants present in groundwater at the Site, as well as their distribution in the various hydrostratigraphic units. Sources, migration pathways, and impacts of the contamination will be assessed and depicted, as will the passive treatment systems that are in place to intercept the contamination. As appropriate, results from the SWWB and Actinide Migration Evaluation (AME) will be included. The SR will include figures that adequately portray the distribution and migration of contaminants in groundwater at the Site, including the extent of contamination above surface water standards. The information for this SR will be gathered from existing reports, and will be compiled and edited to satisfy the CERCLA RI report requirement. The SR will be incorporated into the draft RI/FS report as Section 3.4 (see Attachment 1).

4.11 Task 11 – Prepare the Nature and Extent of Surface Water and Sediment Contamination SR

This SR will summarize the types of contaminants present in surface water and sediments at the Site, as well as their distribution in the three drainages, Woman Creek, North Walnut Creek, and South Walnut

Creek (and tributaries thereto) Groundwater and surface soil sources for the contamination will be depicted As appropriate, results from the SWWB and AME will be included to support demonstration of compliance with surface water quality standards The SR will include figures that adequately portray the distribution and migration of contaminants in surface water at the Site The SR will be incorporated into the draft RI/FS report as Section 3.5 (see Attachment 1)

4.12 Task 12 – Prepare the Nature and Extent of Soil Contamination SR

This SR will summarize the types of contaminants present in soil at the Site, as well as their areal and vertical distribution The SR will include figures that adequately portray the distribution of contaminants in surface and subsurface soil at the Site, including the extent of contamination above the respective preliminary remediation goals (PRGs) defined by the Task 3 TM Results from the AME will be incorporated, as appropriate The SR will be incorporated into the draft RI/FS report as Sections 3.3 (see Attachment 1)

4.13 Task 13 – Prepare the Draft Comprehensive Risk Assessment

A draft CRA will be prepared to support the RI/FS for the Site The draft CRA will evaluate human health and ecological risks posed by the Site at the conclusion of accelerated remedial actions

The exposure assessment will encompass Data Quality Objectives, identification of COCs and their physical and chemical characteristics, assessment and selection of exposure pathways receptors, discussion of sources of contamination and source term quantification, transport modeling as necessary to predict exposure point contaminant concentrations, and quantification of intake to receptors Transport modeling will include air dispersion modeling and groundwater transport in the unsaturated and saturated zones as required to estimate contaminant concentrations from source terms to potential receptor locations Groundwater transport will be assessed as a function of time to evaluate potential impacts on surface water and support remedial action decisions of contaminant plumes and source terms

The toxicity assessment will include review of available databases for oral and inhalation Reference Doses, Reference Concentrations, and slope factors for selected COCs Reference Doses and slope factors will be derived for those COCs without published limits

Following the screening process and comparison to natural background, risk characterization will utilize results of the intake and toxicity assessment results to calculate hazard indices and carcinogenic risk for COCs retained Hazard indices will be summed for all chemical COCs to quantify the cumulative impact to each receptor exposed to the potential inhalation of airborne contaminants, and ingestion of contaminated surface water, groundwater, and surface soils Carcinogenic risks will be determined in a similar manner for all radiological COCs Dermal and external exposure pathways will also be assessed A qualitative uncertainty analysis will be conducted to assess the primary sources of uncertainty in the human health risk assessment results

An ecological risk screening assessment was performed for areas in the buffer zone Under this task, an ecological risk screening assessment will be conducted for areas that have not yet been addressed using existing data for COCs in soils

A summary ecological risk assessment document will be developed to evaluate and resolve all potential COCs exceeding screening levels for eco-receptors identified in the ecological risk screening reports for

the buffer zone and industrial area. Screening results will be used to derive remedial cleanup levels in surface water, soils, and sediments as necessary to ensure adequate protection of identified species in the buffer zone and Industrial Area.

A summary and conclusions section will be completed for the draft CRA to identify primary issues of concern, and discuss findings of the report. The draft CRA will be incorporated into the draft RI/FS report as Section 5 (see Attachment 1).

4.14 Task 14 – Prepare the Detailed Analysis of Alternatives TM

This TM will provide a detailed analysis of at least 3 remedial alternatives applicable to final closure of the Site after completion of all accelerated actions. The alternatives selected for detailed analysis will reflect discussions between DOE and the regulatory agencies, as documented in the CERCLA Administrative Record, regarding development and screening of alternatives relative to the RFETS end state. The detailed analysis will evaluate the alternatives against the nine CERCLA criteria, and take into consideration long-term stewardship. The stewardship evaluation will examine post-closure requirements of each remedial alternative. The evaluation of the alternatives will consider predicted contaminant fate and transport over time. The task includes incorporation of DOE and regulatory agency comments on the draft TM. The TM will be incorporated into the draft RI/FS report as Section 7 (See Attachment 1).

4.15 Task 15 – Prepare the Draft RI/FS Report

This task includes all activities required for assembly of the draft RI/FS report (Attachment 1). Unlike the traditional RI and FS reports prepared under CERCLA (or RCRA), the draft RI/FS report will be a single document that contains the essential features of a RI and FS report.

Activities to be conducted under this task include incorporating the TMs, SRs and draft CRA into the report, as well as compiling the appendices. The appendices include summaries of no further action determinations, long-term stewardship considerations for accelerated actions, and closeout reports. An Executive Summary and a Summary and Conclusions (Section 8) will also be prepared for the draft RI/FS report.

5.0 SCHEDULE

The schedule for preparation of the draft RI/FS is presented in Attachment 2. The tasks for preparing the TMs involving cleanup goals, modifying the RFCA attachments (if required), and preparing the CRA Work Plan (Tasks 1 through 5, and 8) will be conducted in the first year because of their importance in ensuring that accelerated actions are consistent with the approved RAOs. Tasks 6, 7 and 9, which represent assembling and editing current information about the Site, have been shown to follow in sequence after completion of Task 5. However, these tasks can be started earlier because they are not dependent on final Site conditions, albeit some modifications may be necessary during compilation of the draft RI/FS report. Tasks 10 through 12 are sequenced after completion of Task 9, and Tasks 13 and 14 are scheduled towards the end of Site cleanup because they cannot be completed until all final Site data are available. The final task, preparing the draft RI/FS report, is scheduled to be completed by mid December 2005. This schedule is for information only and the sequencing of Tasks may change as information develops. The schedule is not an enforceable requirement of RFCA and it will be updated periodically as work progresses.

ATTACHMENT 1
Streamlined Remedial Investigation/Feasibility Study Report Outline

Executive Summary

- 1 Introduction**
 - 1 1 Purpose of Report**
 - 1 2 Site Background**
 - 1 2 1 Site Description**
 - 1 2 2 Site History**
 - 1 2 3 Operable Units (*original and current*)**
 - 1 2 4 Previous Investigations**
 - 1 2 5 Previous Interim Measures/Interim Remedial Actions**
 - 1 2 6 Existing Records of Decision**
 - 1 2 7 Site Characterizations and Accelerated Actions**
 - 1 3 Report Organization**
- 2 Physical Characteristics of the Study Area**
 - 2 1 Introduction**
 - 2 2 Surface Features**
 - 2 3 Meteorology**
 - 2 4 Surface Water Hydrology**
 - 2 5 Geology**
 - 2 6 Soils**
 - 2 7 Hydrogeology**
 - 2 8 Demography and Land Use**
 - 2 9 Ecology**
- 3 Nature and Extent of Contamination**
 - 3 1 Site Conceptual Model**
 - 3 2 Action Levels**
 - 3 3 Surface and Subsurface Soils**
 - 3 3 1 Surface Soil**
 - 3 3 2 Subsurface Soil**
 - 3 4 Ground Water**
 - 3 5 Surface Water and Sediments**
 - 3 5 1 Surface Water**
 - 3 5 2 Sediments**
 - 3 6 Air**
- 4 Contaminant Fate and Transport**
 - 4 1 Potential Routes of Migration (i.e. air, ground water, etc.)**
 - 4 2 Contaminant Persistence**
 - 4 3 Contaminant Migration**
- 5 Comprehensive Risk Assessment**
 - 5 1 Human Health Evaluation**
 - 5 1 1 Exposure Assessment**

- 5 1 2 Toxicity Assessment
- 5 1 3 Risk Characterization
- 5 2 Ecological Evaluation
- 6 Remedial Action Objectives
 - 6 1 Introduction
 - 6 2 CERCLA vs RCRA Closure Criteria
 - 6 3 Surface Soil (depth to 6 inches)
 - 6 4 Subsurface Soil (depth >6 inches)
 - 6 5 Groundwater
 - 6 6 Surface Water
 - 6 1 1 Water Quality Standards
 - 6 1 2 Monitoring Parameters
 - 6 1 3 Points of Compliance
 - 6 1 4 Demonstration of Compliance
 - 6 7 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
- 7 Detailed Analysis of Alternatives
 - 7 1 Introduction
 - 7 2 Individual Analysis of Alternatives
 - 7 2 1 Alternative 1 (No Action)
 - 7 2 1 1 Description
 - 7 2 1 2 Assessment
 - 7 2 2 Alternative 2 (Limited Action [Long Term Stewardship])
 - 7 2 2 1 Description
 - 7 2 2 2 Assessment
 - 7 2 3 Alternative 3
 - 7 3 Comparative Analysis
- 8 Summary and Conclusions
 - 8 1 Summary
 - 8 1 1 Nature and Extent of Contamination
 - 8 1 2 Fate and Transport
 - 8 1 3 Risk Assessment
 - 8 1 4 Recommended Alternative

Appendices

Appendix A - Soil Action Levels

Appendix B - No Further Action Determination Summaries

Appendix C – Annual Summaries of Long-Term Stewardship Considerations for Accelerated Actions

Appendix D - Closeout Report Summaries

Appendix E - Comprehensive Risk Assessment Work Plan (includes Methodology for Selecting Contaminants of Concern)

Appendix F – Applicable or Relevant and Appropriate Requirements

Appendix G -Analytical Data and QA/QC Evaluation Results

**ATTACHMENT 2
DRAFT RI/FS REPORT
SCHEDULE**

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Draft RI/FS Report Schedule

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Free Float	Total Float	ES00	ES01	ES02	ES03	ES04	ES05	ES06	ES07
1 GAB0202	Develop Internal Final CAD-RD Schedule	60	08FEB01	10MAY01	119	154								
1 GFR00101	RI/FS Work Plan	48	19NOV01	07FEB02	0	35								
1 GFR00102	Prepare Draft RI/FS Workplan	10	19NOV01	03DEC01	0	35								
1 GFR00103	Incorp Internal Comments on Draft RI/FS Workplan	5	03DEC01	13DEC01	0	35								
1 GFR00104	Submit Draft RI/FS Workplan to DO	5	14DEC01	20DEC01	0	35								
1 GFR00105	DOE Review Draft RI/FS Workplan	10	24DEC01	03JAN02	0	35								
1 GFR00106	Incorporate DOE Comments on Draft RI/FS Workplan	5	10JAN02	15JAN02	0	35								
1 GFR00107	DO RI/FS Work Plan Agency Review & Comment	14	17JAN02	30JAN02	0	55								
1 GFR00108	DO RI/FS Work Plan Agency Review & Comment	5	31JAN02	07FEB02	0	35								
1 GFR00201	Prepare Draft ARAR s T	10	08DEC01	20DEC01	0	64								
1 GFR00202	Internal Review Draft ARAR s T	5	08DEC01	13DEC01	0	154								
1 GFR00203	Incorporate Internal Comments ARAR s T	5	24DEC01	31DEC01	0	154								
1 GFR00204	Submit Draft ARAR s T to DOI	5	02JAN02	09JAN02	0	154								
1 GFR00205	DOE Review Draft ARAR s T	20	10JAN02	08FEB02	0	154								
1 GFR00206	Incorporate DOE Comments on Draft ARAR s T	5	11FEB02	18FEB02	0	154								
1 GFR00207	Submit ARAR's T to Regulatory Agency	14	19FEB02	04MAR02	0	244								
1 GFR00208	Agency Review & Comment ARAR's T	5	05MAR02	11MAR02	0	154								
1 GFR00209	Agency Approval of ARAR s T	0	0	11MAR02	118	154								
1 GFR00401	Prepare Draft Soil Action Levels T	30	08FEB02	28MAR02	0	35								
1 GFR00402	Internal Review Draft SAL s T	78	08FEB02	11JUN02	0	96								
1 GFR00403	Incorporate Internal Comments SAL s T	5	27MAR02	03APR02	0	95								
1 GFR00404	Submit Draft SAL s T to DOI	5	04APR02	10APR02	0	95								
1 GFR00405	DOE Review Draft SAL s T	20	11APR02	13MAY02	0	95								
1 GFR00406	Incorporate DOE Comments on Draft SAL s T	5	14MAY02	20MAY02	0	95								
1 GFR00407	Submit SAL s T to Regulatory Agency	14	21MAY02	03JUN02	0	153								
1 GFR00408	Agency Review & Comment SAL s T	5	04JUN02	11JUN02	0	96								
1 GFR00409	Agency Approval of SAL s T	0	0	11JUN02	60	96								

CLOSURE
KAISER HILL
ARCEC HILLS CLOSURE PROJECT

KAISER HILL COMPANY
BCP 2138 Proposed Schedule

2:18
Early Start
Early Finish
Duration
Activity

March 11, 2002

Draft RI/FS Report Schedule, cont.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Free Float	Total Float	ES	EF	LS	LF	ES	EF	LS	LF
1GFR00001C	Prepare Draft Site & Groundwater RAO's T1	30	27MAR02	26JUN02	0	35								
1GFR00002C	Site & Groundwater RAO's Technical Memoranda	75	27MAR02	30JUL02	0	85								
1GFR00003C	Internal Review Draft S & GW RAO's T1	5	14MAY02	20MAY02	0	85								
1GFR00004C	Incorporate Internal Comments S & GW RAO's T1	5	21MAY02	26MAY02	0	85								
1GFR00005C	Submit Draft S & GW RAO's T1 to DOI	0			0	85								
1GFR00006C	DOE Review Draft S & GW RAO's T1	20	30MAY02	26JUN02	0	85								
1GFR00007C	Incorporate DOE Comments on Draft S & GW RAO's T1	5	01JUL02	06JUL02	0	85								
1GFR00008C	Agency Review & Comment S & GW RAO's T1	14	10JUL02	23JUL02	0	103								
1GFR00009C	Incorporate Agency Comments S & GW RAO's T1	5	24JUL02	30JUL02	0	103								
1GFR00010C	Agency Approval of S & GW RAO's T1	0			29	65								
1GFR00011C	Prepare Draft Surface Water RAO's T1	30	14MAY02	26JUN02	0	35								
1GFR00012C	Surface Water RAO's Technical Memoranda	75	14MAY02	16SEP02	0	36								
1GFR00013C	Internal Review Draft Surface Water RAO's T1	5	01JUL02	06JUL02	0	35								
1GFR00014C	Incorporate Internal Comments Surface Water RAO's T1	5	10JUL02	16JUL02	0	35								
1GFR00015C	Submit Draft Surface Water RAO's T1 to DOI	0			0	35								
1GFR00016C	DOE Review Draft Surface Water RAO's T1	20	17JUL02	15AUG02	0	35								
1GFR00017C	Incorporate DOE Comments on Surface Water RAO's T1	5	15AUG02	23AUG02	0	35								
1GFR00018C	Agency Review & Comment Surface Water RAO's T1	0			0	35								
1GFR00019C	Agency Approval of Surface Water RAO's T1	14	24AUG02	06SEP02	2	58								
1GFR00020C	Incorporate Agency Comments Surface Water RAO's T1	5	06SEP02	16SEP02	0	58								
1GFR00021C	Agency Approval of Surface Water RAO's T1	0			0	36								
1GFR00022C	Modify Attachments to RFC	75	17SEP02	16JAN03	0	35								
1GFR00023C	Prepare RFC Attachments Modification	20	17SEP02	16OCT02	0	36								
1GFR00024C	Submit RFC Attachments Modification	0			0	36								
1GFR00025C	Public Review of RFC Attachments Mod	45	17OCT02	30NOV02	1	59								
1GFR00026C	Incorporate Public Comments to RFC Attachments Mod	20	02DEC02	02JAN03	0	35								
1GFR00027C	Agency Review & Approval of RFC Attachments Mod	14	02JAN03	16JAN03	3	56								
1GFR00028C	RFC Attachments Mod Approved by Agency	0			0	35								
1GFR00029C	Site Background Summary Report	90	26JAN03	06JUN03	0	35								
1GFR00030C	Prepare Draft Site Background Summary Report	80	26JAN03	21APR03	0	35								
1GFR00031C	Internal Review of Site Background Summary Report	10	22APR03	06MAY03	0	35								
1GFR00032C	Incorporate Internal Comments on Draft Site Background Summary Report	20	07MAY03	06JUN03	0	35								
1GFR00033C	Submit Draft Site Background Summary Report to DOI	0			0	35								
1GFR00034C	Physical Characteristics of Study Area Summary Report	110	10JUN03	02DEC03	0	35								
1GFR00035C	Prepare Draft Physical Characteristics Summary Report	80	10JUN03	14OCT03	0	35								
1GFR00036C	Internal Review of Physical Characteristics Summary Report	10	15OCT03	29OCT03	0	35								
1GFR00037C	Incorporate Internal Comments Physical Characteristics Summary Report	20	30OCT03	06DEC03	0	35								
1GFR00038C	Submit Draft Physical Characteristics Summary Report to DOI	0			0	35								

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Draft RI/FS Report Schedule, cont.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Five Float	Total Float	ES00	ES10	ES20	ES30	ES40	ES50
1GFR000010	Prepare Draft CRA Work Plan	120	08DEC01	14JUN02	0	0						
1GFR000020	Internal Review Draft CRA Work Plan	177	08DEC01	18SEP02	0	0						
1GFR000030	Internal Review Draft CRA Work Plan	5	17JUN02	24JUN02	0	0						
1GFR000040	Submit Draft CRA Work Plan to DOE	5	25JUN02	01JUL02	0	0						
1GFR000050	DOE Review Draft CRA Work Plan	20	02JUL02	01AUG02	0	0						
1GFR000060	Incorporate DOE Comments on CRA Work Plan	5	05AUG02	09AUG02	0	0						
1GFR000070	Submit Draft CRA Work Plan to Regulatory Agencies	30	10AUG02	08SEP02	0	0						
1GFR000080	Agency Review & Comment on CRA Work Plan	5	08SEP02	16SEP02	0	0						
1GFR000090	Incorporate Agency Comments on CRA Work Plan	0	16SEP02	16SEP02	0	0						
1GFR000100	Final Draft CRA Work Plan Approved by Agencies	100	03DEC03	10MAY04	0	0						
1GFR000110	Prepare Draft NRE of Air Contamination SF	135	03DEC03	06JUL04	0	0						
1GFR000120	Nature & Extent of Air Contamination SF	15	07JUL04	02AUG04	0	0						
1GFR000130	Internal Review NRE of Air Contamination SF	20	03JUL04	06JUL04	0	0						
1GFR000140	Submit Draft NRE of Air Contamination SF to DOE	0	06JUL04	06JUL04	0	0						
1GFR000150	DOE Review Draft NRE of Air Contamination SF	100	10MAY04	13OCT04	0	0						
1GFR000160	Incorporate DOE Comments on NRE of Air Contamination SF	135	11MAY04	13OCT04	0	0						
1GFR000170	Submit Draft NRE of Air Contamination SF to DOE	15	16OCT04	09NOV04	0	0						
1GFR000180	DOE Review Draft NRE of Air Contamination SF	20	10NOV04	13DEC04	0	0						
1GFR000190	Incorporate DOE Comments on NRE of Air Contamination SF	0	13DEC04	13DEC04	0	0						
1GFR000200	Final Draft NRE of Air Contamination SF Approved by Agencies	100	23NOV04	02MAY05	0	0						
1GFR000210	Prepare Draft NRE of Surface Water & Soil Cont SF	135	23NOV04	27JUN05	0	0						
1GFR000220	Nature & Extent of Surface Water & Soil Cont SF	15	03MAY05	25MAY05	0	0						
1GFR000230	Internal Review NRE of Surface Water & Soil Cont SF	20	28MAY05	27JUN05	0	0						
1GFR000240	Submit Draft NRE of Surface Water & Soil Cont SF to DOE	0	27JUN05	27JUN05	0	0						
1GFR000250	DOE Review Draft NRE of Surface Water & Soil Cont SF	110	13MAY05	03NOV05	0	0						
1GFR000260	Incorporate DOE Comments on NRE of Surface Water & Soil Cont SF	80	13MAY05	18SEP05	0	0						
1GFR000270	Submit Draft NRE of Surface Water & Soil Cont SF to DOE	15	20SEP05	12OCT05	0	0						
1GFR000280	DOE Review Draft NRE of Surface Water & Soil Cont SF	15	13OCT05	03NOV05	0	0						
1GFR000290	Incorporate DOE Comments on NRE of Surface Water & Soil Cont SF	0	03NOV05	03NOV05	0	0						
1GFR000300	Final Draft NRE of Surface Water & Soil Cont SF Approved by Agencies	110	13MAY05	03NOV05	0	0						
1GFR000310	Prepare Draft NRE of Sediment Cont SF	135	13MAY05	18SEP05	0	0						
1GFR000320	Nature & Extent of Sediment Cont SF	15	20SEP05	12OCT05	0	0						
1GFR000330	Internal Review NRE of Sediment Cont SF	20	13OCT05	03NOV05	0	0						
1GFR000340	Submit Draft NRE of Sediment Cont SF to DOE	0	03NOV05	03NOV05	0	0						
1GFR000350	DOE Review Draft NRE of Sediment Cont SF	110	13MAY05	03NOV05	0	0						
1GFR000360	Incorporate DOE Comments on NRE of Sediment Cont SF	80	13MAY05	18SEP05	0	0						
1GFR000370	Submit Draft NRE of Sediment Cont SF to DOE	15	20SEP05	12OCT05	0	0						
1GFR000380	DOE Review Draft NRE of Sediment Cont SF	15	13OCT05	03NOV05	0	0						
1GFR000390	Incorporate DOE Comments on NRE of Sediment Cont SF	0	03NOV05	03NOV05	0	0						
1GFR000400	Final Draft NRE of Sediment Cont SF Approved by Agencies	110	13MAY05	03NOV05	0	0						
1GFR000410	Prepare Draft Comprehensive Risk Assessment	135	13MAY05	18SEP05	0	0						
1GFR000420	Nature & Extent of Comprehensive Risk Assessment	15	20SEP05	12OCT05	0	0						
1GFR000430	Internal Review Comprehensive Risk Assessment	20	13OCT05	03NOV05	0	0						
1GFR000440	Submit Draft Comprehensive Risk Assessment to DOE	0	03NOV05	03NOV05	0	0						
1GFR000450	DOE Review Draft Comprehensive Risk Assessment	110	13MAY05	03NOV05	0	0						
1GFR000460	Incorporate DOE Comments on Comprehensive Risk Assessment	80	13MAY05	18SEP05	0	0						
1GFR000470	Submit Draft Comprehensive Risk Assessment to DOE	15	20SEP05	12OCT05	0	0						
1GFR000480	DOE Review Draft Comprehensive Risk Assessment	15	13OCT05	03NOV05	0	0						
1GFR000490	Incorporate DOE Comments on Comprehensive Risk Assessment	0	03NOV05	03NOV05	0	0						
1GFR000500	Final Draft Comprehensive Risk Assessment Approved by Agencies	110	13MAY05	03NOV05	0	0						

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Draft RI/FS Report Schedule, cont.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Free Float	Total Float	FW01	FW01	FW01	FW02	FW02	FW03	FW03	FW04	FW04	FW05	FW05	FW06	FW06	FW07
1GFR015010	Prepare Draft Detailed Analysis of Alternative	80	13MAY05	18SEP05	0	5														
1GFR015020	Review Draft Detailed Analysis of Alternative	15	20SEP05	12OCT05	0	5														
1GFR015030	Reconcile Internal Comments Analysis of Alternative	15	13OCT05	03NOV05	0	5														
1GFR015040	Submit Draft Detailed Analysis of Alternative to DOE	0		03NOV05	0	5														
1GFR016000	Prepare Draft RI/FS Report	307	20OCT05	08DEC05	0	5														
1GFR016010	Prepare Draft RI/FS Report	20	20OCT05	21NOV05	0	5														
1GFR016020	Internal Review of Draft RI/FS Report	5	22NOV05	30NOV05	0	5														
1GFR016030	Reconcile Internal Comments on Draft RI/FS Report	5	01DEC05	08DEC05	0	5														
1GFR016040	Submit Draft RI/FS Report to DOE	0		08DEC05	5	5														